

THREE NEW SPECIES OF THE ORB WEAVING SPIDER GENUS *NEOSCONA* SIMON FROM CHINA (ARANEAE, ARANEIDAE)

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Abstract Three new species belonging to the orb weaver spider genus *Neoscona* Simon, 1864 are described and illustrated from China in this paper. These new taxa are *Neoscona zhui* sp. nov., *N. flavescens* sp. nov. and *N. chongzuoensis* sp. nov.

Key words Araneae, *Neoscona*, new species, China.

1 Introduction

Members of the genus *Neoscona* Simon are most common and abundant orb-weavers encountered in different ecosystems throughout the world (Barrión *et al.*, 1986). They can be distinguished from other araneids by somatic and genital characters: a curved, spatula-shaped epigynum whose sclerites appear fused; epigynum often having pairs of lateral bulges (some without bulges); macrosetae of male tibia II; median apophysis bearing a proximal “upper” recurved tooth (Levi, 1993; Levy, 1997). The webs of *Neoscona* species are usually vertical (Berman and Levi, 1971). Up to now, *Neoscona* comprises a world fauna of 106 species, including 29 species from China (Platnick, 2010; Song, Zhu & Chen, 1999; Yin *et al.*, 1997; Li & Wang, 2010).

Recently, while examining the orb weaving spider specimens collected from various areas of China, three new *Neoscona* species are identified and described under the names of *N. zhui* sp. nov., *N. flavescens* sp. nov. and *N. chongzuoensis* sp. nov.

2 Materials and Methods

All measurements are given in millimeters. Carapace length was measured from the anterior margin to the rear margin of the carapace medially. Total length is the sum of carapace and abdomen length, regardless of the petiolus. The measurements of the legs are given as follows: total length (femur, patella, tibia, metatarsus, tarsus). All specimens are preserved in 75 % alcohol and were examined and drawn under a Tech XTL-II stereomicroscope equipped with an Abbe drawing device.

The following abbreviations are used: ALE, anterior lateral eyes; AME, anterior median eyes; AME-ALE, distance between AME and ALE; AME-AME, distance between AME; C, conductor; E,

embolus; L, lobe of conductor; M, median apophysis; MHBU, the Museum of Hebei University; MOA, median ocular area; PLE, posterior lateral eyes; PME, posterior median eyes; PME-PLE, distance between PME and PLE; PME-PME, distance between PME; TA, terminal apophysis.

All specimens examined in this study are deposited in the Museum of Hebei University (MHBU), Baoding, China.

3 Taxonomy

Araneidae Simon, 1895

Neoscona zhui sp. nov. (Figs 1–9)

Holotype ♀, China, Fujian Province, Wuyishan National Natural Reserve (27°49'N, 117°50'E), 17 July 2003, ZHANG Chao leg. Paratype 1 ♂, same data as holotype.

Etymology. The specific name is a patronym in honor of the late Prof. ZHU Ming-Sheng, a well-known arachnologist from China, noun.

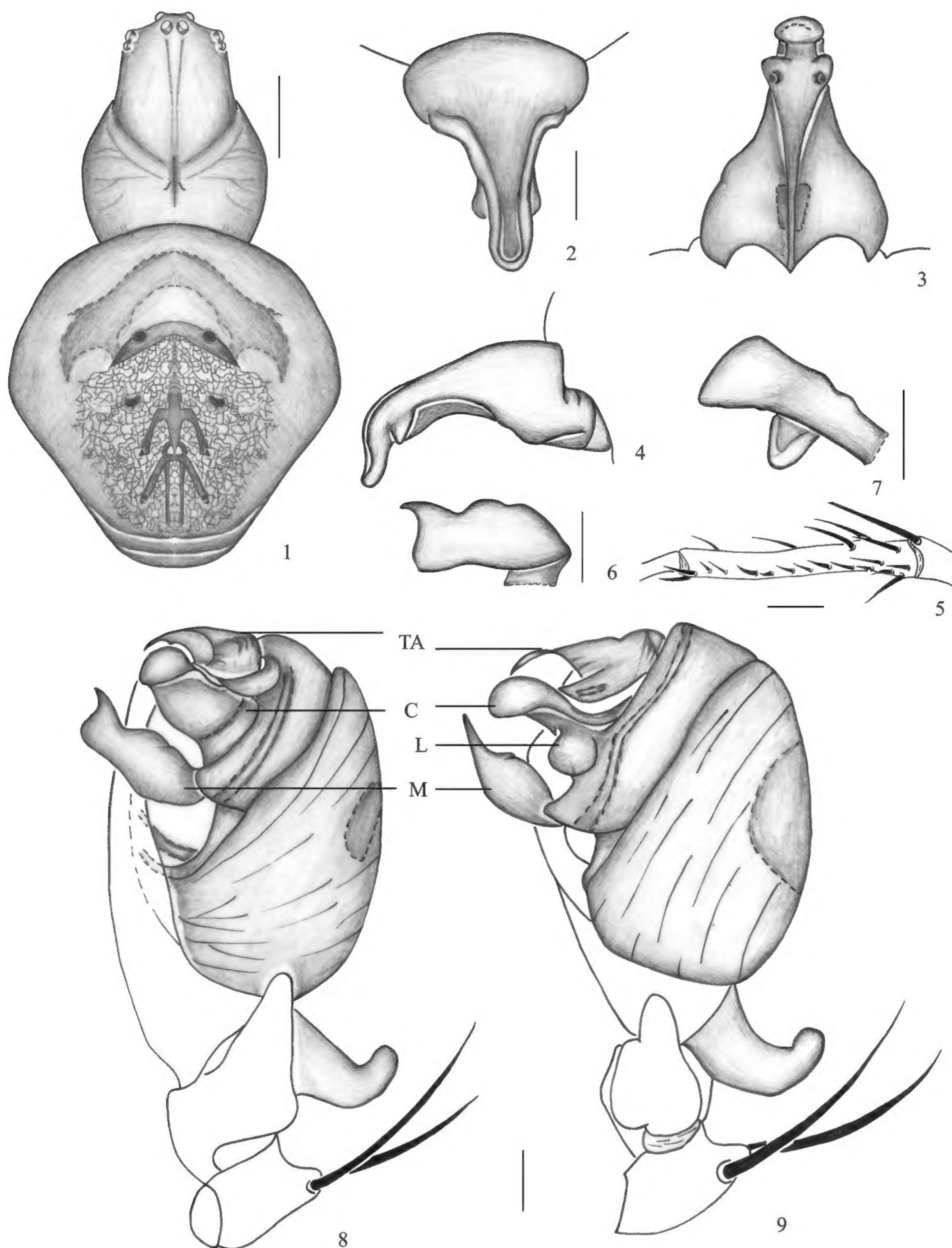
Diagnosis. The female of *Neoscona zhui* can be distinguished from *N. multiplicans* (Chamberlin, 1924) by a longer epigynum which is narrower at its base; by the position of lateral bulges on the scape (middle in *Neoscona zhui*, distal in *N. multiplicans*). The male of *N. zhui* differs from *N. multiplicans* by the conductor with a dark, sclerotized lobe which is absent in *N. multiplicans*; by the location of the tooth on the median apophysis; by coxa IV with a soft tubercle which is absent in *N. multiplicans*.

The female of *Neoscona zhui* can also be distinguished from *N. scylloides* (Bösenberg & Strand, 1906) by a shorter scape. The male of *N. zhui* differs from *N. scylloides* by macrosetae of tibia II; by a smaller median apophysis; by terminal apophysis with a concave edge which is absent in *N. scylloides*.

This work was supported by the National Natural Science Foundation of China (31071885, 30970325, 31093430), and in part by the Doctoral Program Foundation of Institutions of Higher Education of China (20091301120005) to Dr. ZHANG Feng.

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Received 12 Apr. 2011, accepted 23 May 2011.



Figs 1 – 9. *Neoscona zhui* sp. nov. 1 – 4. Female. 1. Habitus, dorsal view. 2. Epigynum, ventral view. 3. Same, posterior view. 4. Same, lateral view. 5 – 9. Male. 5. Tibia II, prolateral view. 6. Median apophysis of male palp, ventral view. 7. Conductor of male palp, ventral view. 8. Left male palp, retrolateral view. 9. Same, prolateral view. Scale bars: 1 = 2.0 mm, 2 – 4 = 0.2 mm, 5 = 0.8 mm, 6 – 7 = 0.3 mm, 8 – 9 = 0.1 mm.

Description. Female (holotype) total length 9.69; cephalothorax 4.08 long, 3.26 wide; abdomen 5.92 long, 5.61 wide. Carapace yellow brown. Cervical groove dark brown, radial grooves inconspicuous (Fig. 1). Fovea deep and longitudinal. Clypeal height 0.15, less than AME diameter. Both eye rows recurved from above, posterior eye row wider than

anterior one. Eye diameters: AME 0.20, ALE 0.15, PME 0.18, PLE 0.15; eye interdistances: AME-AME 0.25, AME-ALE 0.45, PME-PME 0.13, PME-PL 0.53. MOA trapezoidal, longer than wide (0.58:0.55), narrower in back than in front (0.45:0.55). Chelicerae brown, with four promarginal teeth (third the largest) and three retromarginal teeth (last

the largest). Labium yellowish, distal part yellow, wider than long (0.82:0.51). Endites yellow, inner margins with some thin setae. Sternum orange, longer than wide (1.94: 1.63). Legs dark brown with light annulations. Leg measurements: I 14.47 (4.28 + 1.94 + 3.36 + 3.77 + 1.12), II 12.75 (3.88 + 1.63 + 3.06 + 3.26 + 0.92), III 8.26 (2.65 + 1.12 + 1.73 + 1.94 + 0.82), IV 13.47 (4.28 + 1.53 + 3.37 + 3.37 + 0.92). Leg formula: 1423. Abdomen (Fig. 1) triangular, covered with gray patches. Dorsum with a blackish pattern anteriorly and a median dendritic pattern. Venter brown, with 2 pairs of white spots on each side of spinnerets. Base of epigynum (Figs 2–4) relatively wide. Scape ligulate, with a pair of lateral bulges, the distal segment spoon-shaped; copulatory openings situated dorsally.

Male (paratype). Total length 7.45; cephalothorax 3.57 long, 3.06 wide; abdomen 4.69 long, 2.55 wide. Carapace yellowish. Fovea longitudinal and radial grooves inconspicuous. Clypeal height 0.05. Eye diameters: AME 0.18, ALE 0.10, PME 0.15, PLE 0.10; eye interdistances: AME-AME 0.15, AME-ALE 0.25, PME-PME 0.13, PME-PLE 0.45. MOA trapezoidal, wider than long (0.50:0.48), narrower in back than in front (0.43:0.50). Chelicerae yellow, with four promarginal teeth (third the largest) and three retromarginal teeth. Labium and endites yellowish. Legs yellow. Coxa I with a small hook and femur II with opposing groove. Tibia II (Fig. 5) with two rows of clasping macrosetae tapering to a single row of macrosetae near the proximal end. Coxa IV with a soft tubercle in posterior view. Leg measurements: I 16.51 (4.79 + 1.63 + 4.28 + 4.59 + 1.22), II 14.37 (4.59 + 1.53 + 3.26 + 3.77 + 1.22), III 8.57 (2.86 + 1.12 + 1.73 + 2.04 + 0.82), IV 14.28 (4.69 + 1.53 + 3.26 + 3.88 + 0.92). Leg formula: 1243. Abdomen gray, with a median dendritic pattern. Palp (Figs 6–9) with two long patellar macrosetae. Terminal apophysis long, with a transparent distal part; conductor S-shaped in retrolateral view; median apophysis large, with a hook-shaped tooth distally.

Distribution. Known from the type location only.

Neoscona flavescens sp. nov. (Figs 10–18)

Holotype ♀, China, Guizhou Province, Libo County (25°24'N, 107°53'E), 10 May 2008, CHEN Hui-Ming leg. Paratype 1 ♂, same data as holotype.

Etymology. The specific name is derived from the Latin word “*flavescens*”, referring to the color of the body, adjective.

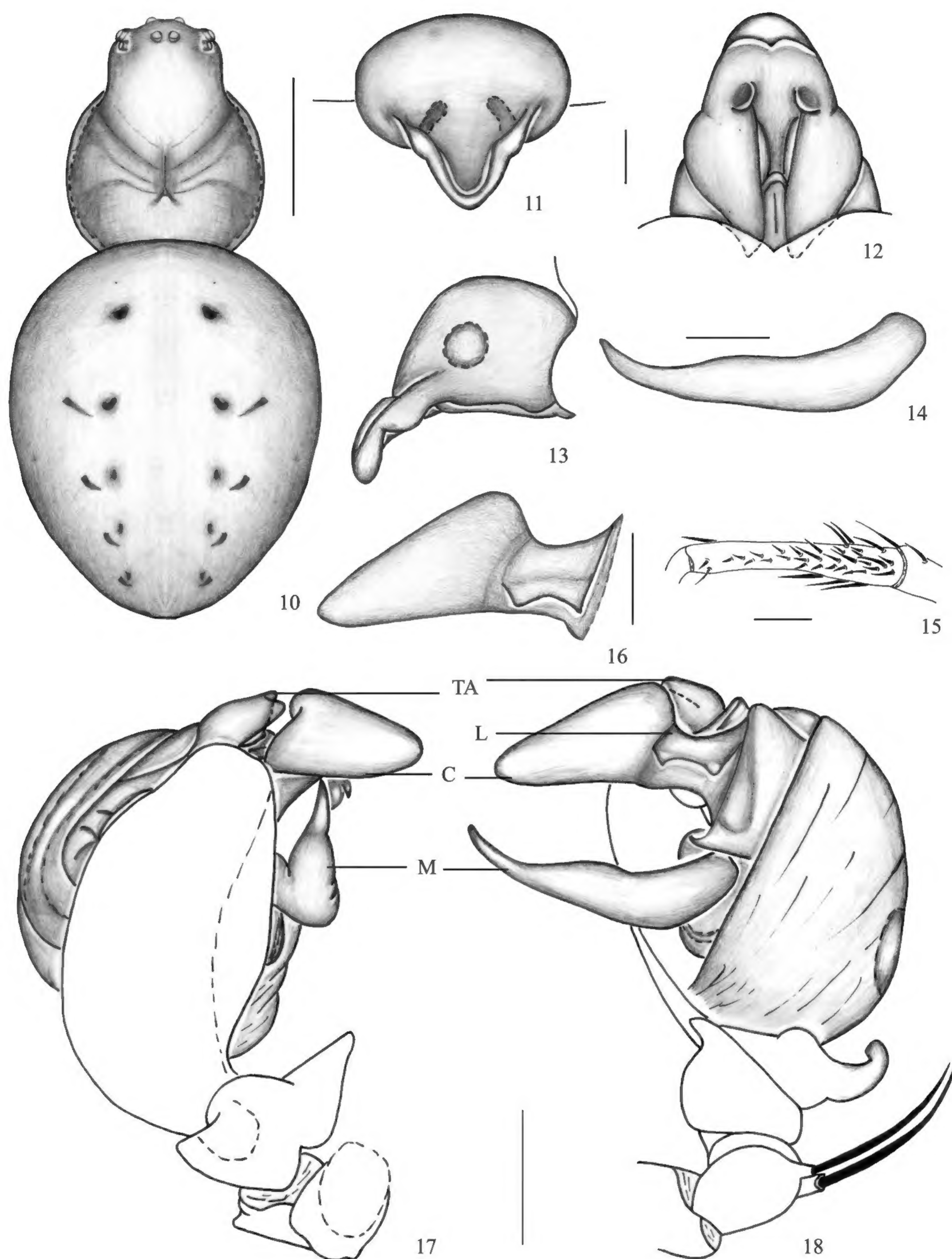
Diagnosis. The female of *Neoscona flavescens* can be distinguished from *N. polyspinipes* Yin *et al.*, 1990 by pairs of characteristic semi-lunar abdominal marks dorsally; by a shorter, wider epigynum. The male of

N. flavescens differs from *N. polyspinipes* by having a longer median apophysis; by the conductor with a sclerotized lobe which is absent in *N. polyspinipes*.

This female of *Neoscona flavescens* can also be distinguished from *N. menghaiensis* Yin, Peng & Wang by the scape (scape shorter than that of *N. menghaiensis*). The male of *N. flavescens* differs from *N. menghaiensis* by having a longer median apophysis; by the lobe of conductor, two apophyses in the former but one in the later.

Description. Female (holotype) total length 8.98; cephalothorax 3.67 long, 2.86 wide; abdomen 5.92 long, 4.90 wide. Carapace yellow brown, with white thin setae. Cervical groove dark brown, radial grooves inconspicuous (Fig. 7). Fovea longitudinal. Clypeal height 0.10, less than AME diameter. Both eye rows recurved, posterior eye row wider than anterior one from above. Eye diameters: AME 0.18, ALE 0.13, PME 0.15, PLE 0.10; eye interdistances: AME-AME 0.20, AME-ALE 0.43, PME-PME 0.08, PME-PLE 0.48. MOA trapezoidal, wider than long (0.53:0.50), narrower in back than in front (0.40:0.53). Chelicerae brown, with four promarginal teeth (third the largest) and four retromarginal teeth (third the largest). Labium brown, distal part yellow, wider than long (0.71:0.40). Endites brown, inner margins yellowish, with some thin setae. Sternum light centrally, darker along margins. Legs strong and yellow. Leg measurements: I 13.46 (4.08 + 1.63 + 3.16 + 3.47 + 1.12), II 11.12 (3.57 + 1.43 + 2.55 + 2.75 + 0.82), III 7.24 (2.55 + 0.82 + 1.53 + 1.63 + 0.71), IV 11.93 (4.28 + 1.43 + 2.55 + 2.75 + 0.92). Leg formula: 1423. Abdomen (Fig. 7) oval. Dorsum brown, with four pairs of dark semilunar patterns laterally. Venter yellow brown, with a pair of white spots on each side of spinnerets. Base of epigynum wide (Figs 11–13). Scape short and ligulate. Copulatory openings situated dorsally.

Male (paratype) total length 8.67; cephalothorax 5.10 long, 4.18 wide; abdomen 4.39 long, 3.57 wide. Carapace brown, dark on sides. Fovea deep and longitudinal. Clypeal height 0.05, less than AME diameter. Eye diameters: AME 0.18, ALE 0.15, PME 0.15, PLE 0.13; eye interdistances: AME-AME 0.23, AME-ALE 0.38, PME-PME 0.13, PME-PLE 0.55. MOA trapezoidal, wider than long (0.70:0.63), narrower in back than in front (0.43:0.70). Chelicerae yellow, with four promarginal teeth and three retromarginal teeth. Legs yellow. Coxa I with a small hook and femur II with opposing groove; tibia II (Fig. 15) with three rows of clasping macrosetae. Leg measurements: I 16.31 (5.10 + 2.14 + 4.18 + 3.26 + 1.63), II 14.28 (4.49 + 1.94 + 3.57 + 3.06 + 1.22), III 8.36 (2.96 + 1.12



Figs 10–18. *Neoscona flavescens* sp. nov. 10–13. Female. 10. Habitus, dorsal view. 11. Epigynum, ventral view. 12. Same, posterior view. 13. Same, lateral view. 14–18. Male. 14. Median apophysis of male palp, ventral view. 15. Tibia II, prolateral view. 16. Conductor of male palp, prolateral view. 17. Left male palp, dorsal view. 18. Same, prolateral view. Scale bars: 10 = 3.0 mm, 11–13 = 0.1 mm, 14, 16 = 0.5 mm, 15 = 0.8 mm, 17–18 = 0.3 mm.

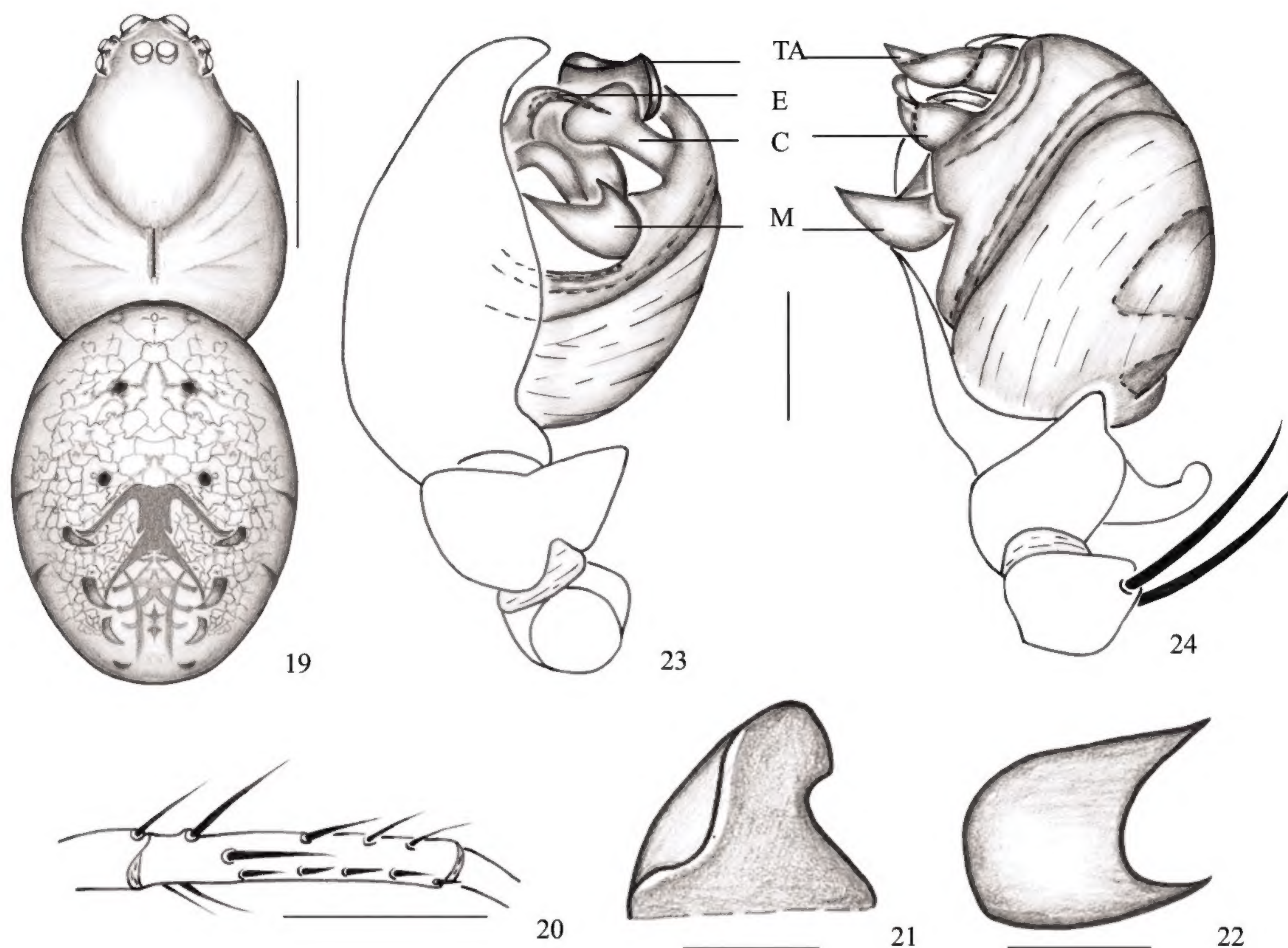
+ 1.63 + 1.73 + 0.92), IV 13.15 (4.90 + 1.73 + 2.75 + 3.16 + 0.61). Leg formula: 1243. Abdomen triangular. Palp (Figs 14, 16–18) with two long patellar macrosetae. Terminal apophysis with a flat flap, its sides more or less parallel; conductor large, with a sclerotized lobe; median apophysis long, with a distal hook.

Distribution. Known from the type location only.

***Neoscona chongzuoensis* sp. nov.** (Figs 19–24)

Holotype ♂, Guangxi Province, Chongzuo City, Banli Town (22°16'N, 107°10'E), 21 Aug. 2004, ZHU Ming-Sheng leg.

Etymology. The specific name is derived from the type locality, noun.



Figs 19 – 24. *Neoscona chongzuoensis* sp. nov. 19 – 24. Male. 19. Habitus, dorsal view. 20. Tibia II, prolateral view. 21. Conductor of male palp, ventral view. 22. Median apophysis of male palp, ventral view. 23. Left male palp, retrolateral view. 24. Same, prolateral view. Scale bars: 19 – 20 = 0.5 mm, 21 – 22 = 0.3 mm, 23 – 24 = 0.1 mm.

Diagnosis. The male of *Neoscona chongzuoensis* can be distinguished from *N. pseudoscylla* (Schenkel, 1953) by: median apophysis with two teeth (one tooth in *N. pseudoscylla*); embolus curved (relatively straight in *N. pseudoscylla*).

Description. Male (holotype) total length 3.47; cephalothorax 1.53 long, 1.22 wide; abdomen 2.04 long, 1.53 wide. Carapace yellow. Cervical groove and radial grooves inconspicuous (Fig. 19). Clypeal height 0.05, less than AME diameter. Both eye rows recurved, posterior eye row wider than anterior one. Eye diameters: AME 0.13, ALE 0.08, PME 0.10, PLE 0.08; eye interdistances: AME-AME 0.10, AME-ALE 0.05, PME-PME 0.05, PME-PLE 0.13. MOA trapezoidal, wider than long (0.35 : 0.33), narrower in back than in front (0.35 : 0.25). Chelicerae yellow, with three promarginal teeth (first the largest) and three retromarginal teeth. Labium yellowish, wider than long (0.71 : 0.41). Endites yellowish, inner margins with some thin setae. Sternum yellow, longer than wide (0.71 : 0.41). Legs slender and yellow, with brownish annulations. Coxa I with a small hook and femur II with opposing groove; tibia II (Fig. 20) with a single row of macrosetae increasing to two rows of clasping

macrosetae near the proximal end. Leg measurements: I 7.90 (2.04 + 1.02 + 1.94 + 2.19 + 0.71), II 5.77 (1.79 + 0.51 + 1.33 + 1.53 + 0.61), III 3.51 (1.28 + 0.46 + 0.71 + 0.56 + 0.50), IV 4.64 (1.53 + 0.51 + 0.92 + 1.17 + 0.51). Leg formula: 1243. Abdomen (Fig. 19) oval. Dorsum with milky-white patches, posterior part with 3 pairs of black semilunar patterns and a median dendritic pattern. Venter yellowish. Palp (Figs 21 – 24) with two long patellar macrosetae. Terminal apophysis elongated, with a deep notch; conductor bone-shaped, with a long arm; embolus curved in prolateral view; median apophysis large, with two teeth.

Distribution. Known from the type location only.

Acknowledgements We are grateful to Prof. ZHU Ming-Sheng, Drs. CHEN Hui-Ming and ZHANG Chao for collecting valuable specimens. Dr. WANG Xin-Ping kindly helped reviewing the English of the manuscript.

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中国新园蛛属三新种（蜘蛛目，园蛛科）

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摘 要 记述中国园蛛科新园蛛属 3 新种：朱氏新园蛛 *Neoscona zhui* sp. nov., 黄色新园蛛 *N. flavescens* sp. nov. 和崇左新园蛛 *N. chongzuoensis* sp. nov. 模式标本保存在河北大学博物馆。文中测量单位为 mm。

朱氏新园蛛，新种 *Neoscona zhui* sp. nov. (图 1~9)

正模 ♀，福建武夷山自然保护区，2003 年 7 月 17 日，张超采。副模 1 ♂，福建武夷山自然保护区，2003 年 7 月 17 日，张超采。

新种与多褶新园蛛 *N. multiplicans* (Chamberlin, 1924) 近似，区别为：1) 新种雌蛛的外雌器基部窄，垂体较长；2) 新种外雌器垂体的侧隆起位于中部，而多褶新园蛛的侧隆起位于垂体的末端；3) 新种触肢器的引导器有 1 骨质化的裂片，而多褶新园蛛无裂片；4) 两者中突齿的位置不同；5) 新种基节 IV 具 1 肉质的小瘤状突起，而多褶新园蛛无小突起。

新种与类青新园蛛 *N. scylloides* (Bösenberg & Strand, 1906) 近似，区别为：1) 新种雌蛛外雌器的垂体短；2) 新种中突相对较小；3) 新种触肢器的顶突基部具 1 凹陷，而类青新园蛛无凹陷；4) 两者胫节 II 的刚毛数不同。

词源：新种种名以朱明生教授的姓氏拟订，以示对导师的纪念。

地理分布：福建。

黄色新园蛛，新种 *Neoscona flavescens* sp. nov. (图 10~18)

正模 ♀，贵州省荔波县洞腮，1997 年 5 月 10 日，陈会

关键词 蜘蛛目，新园蛛属，新种，中国。

中图分类号 Q959.226

明采。副模 1 ♂，贵州省荔波县洞腮，1997 年 5 月 10 日，陈会明采。

新种与多刺新园蛛 *N. polyspinipes* Yin *et al.*, 1990 近似，区别为：1) 新种雌蛛腹部背面具 1 典型的半月形黑斑；2) 新种垂体较短且宽；3) 新种触肢器的中突较长；4) 新种的引导器具 1 骨质化的裂片，而多刺新园蛛无裂片。

新种与勐海新园蛛 *N. menghaiensis* Yin, Peng & Wang, 1990 近似，区别为：1) 新种雌蛛外雌器的垂体较短；2) 新种中突相对较长；3) 新种引导器的裂片末端具 2 个突起，而勐海新园蛛具 1 个突起。

词源：新种种名来源于拉丁语 “*flavescens*”，指其腹部的体色。

地理分布：贵州。

崇左新园蛛，新种 *Neoscona chongzuoensis* sp. nov. (图 19~24)

正模 ♂，广西省崇左市板利镇，2004 年 8 月 21 日，朱明生采。

新种与拟青新园蛛 *N. pseudoscylla* (Schenkel, 1953) 近似，区别为：1) 两者触肢器中突的形状不同；2) 新种中突具 2 齿，而拟青新园蛛中突具 1 齿；3) 新种插入器弯曲，而拟青新园蛛插入器平直。

词源：新种种名以模式标本的产地而拟订。

地理分布：广西。

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